In the Drawings:

Please amend Figs. 1 and 2 as shown in red in the Request for Approval of Drawing Changes which is being filed simultaneously herewith.

REMARKS

Claims 1-9 remain in this application. No claim has been amended in this Amendment.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Versions with Markings to Show Changes Made.**"

Drawings have been amended to make the correction required by the Examiner. Specifically, Figures 1 and 2 have been designated by a legend --Prior Art--. The specification has been amended so that the term "transducer" and "coupler" are used interchangeably. Accordingly, it is believed that no correction to the drawings are necessary with respect to the use of reference character "5." Withdrawal of the objections to the drawings is respectfully requested.

Claims 1, 2, 5, 6 and 9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kaede et al. Applicants respectfully traverse this rejection because the cited reference does not disclose or suggest features for compensating cross phase modulation as in the present invention.

Independent claim 1 describes a method for compensating for signal changes of a wavelength-division multiplex signal caused specifically by cross phase modulation in a fiber amplifier, and includes obtaining a control signal from an optical wavelength division multiplex signal for controlling a phase modulator. The control signal is then supplied to the wavelength-division multiplex signal to compensate the signal changes of the wavelength-division multiplex signal caused by the cross phase modulation. Independent claim 5 describes similar features in an apparatus.

The Kaede et al. reference relates to an optical transmission system for enabling dispersion pre-equalization 1R multi-step trunk transmission by optically compensation the

dispersion. The system of Kaede et al. includes a circuitry having an optical branching circuit 304 that directs a portion of the output signal from an optical amplifier 302 to a phase modulator driving circuit 307, which outputs a drive signal to an optical phase modulator 303. The drive signal is an envelope signal of the optical signal which phase modulates the signal output from the optical amplifier. This results in precompensation (i.e., preequalization) of the optical signal by changing its frequency.

As described in claims 1 and 5, the present invention is directed to a method and apparatus for compensating cross phase modulation. These claims recite that a control signal, obtained from the optical wavelength division multiplex signal, is supplied to the optical wavelength division multiplex signal to compensate for signal changes caused by cross phase modulation. The Kaede et al. reference does not disclose or suggest this feature of the present invention. While the cited reference does teach dispersion compensation, this is not the same as compensating cross phase modulation in a wavelength-division multiplex signal, as in the present invention. For this reason, claims 1 and 5, along with their dependent claims 2-4 and 6-9 are allowable over Kaede et al.

Although claims 1, 2, 5, 6 and 9 are subject to a rejection under § 102(b), the Office Action cites Saunder et al. as disclosing a method "where the signal is pre-modulated, then transmitted through an optical fiber wherein group delay walkoff caused a low pass filtering effect on the XPM." The Office Action further states that the "same group delay walkoff occurs due to phase modulation which in turn causes the low pass filtering of XPM in the Kaede et al. reference." Even if combined, the cited references still would not disclose or suggest each feature of the present invention.

The Saunders et al. reference relates to method for compensating crosstalk in wavelength division multiplexed (WDM) systems due to cross phase modulation. Specifically, the reference teaches using phase prechirp on an interfering channel to avoid cross phase modulation. When used in a WDM system, the Saunder et al. reference requires modulating each signal separately, i.e., the interfering channel (see, pg. 1768, col. 2, 1st full paragraph). The Saunder et al. reference also teaches precompensation using prechirping data signals at the transmitting side.

The present invention solves the problem of crosstalk between many signals (i.e., channels) in a WDM signal, resulting in cross phase modulation, and calls for measuring the amplitude of the complete WDM signal, and not one channel at a time. This is the because the signal in each channel causes cross phase modulation in other channels. By measuring the complete WDM signal, the resulting signal that causes the cross phase modulation is measured. This measured signal is then used to control only one phase modulator, which modulates all signals in opposite directions. This arrangement allows only one compensation apparatus to compensate cross phase modulation in all signals. These features of the present invention would not be disclosed or suggested even if Kaede et al. and Saunders et al. were combined. For this reason, claims 1 and 5, and their dependent claims 2-4 and 6-9 are allowable over the cited references.

Claims 3, 4 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaede et al. Applicant respectfully traverses this rejection for the reasons given with respect to claims 1 and 5, from which claims 3, 4 and 7 depend, and because of the additional features recited in these dependent claims.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaede et al. in view of Becker et al. Applicant respectfully traverses this rejection for the reasons given with respect to claim 5, from which claim 8 depends, and because of the additional features recited in claim 8.

In light of the above, Applicants respectfully submit that independent claims 1 and 5, as well as claims 2-4 and 6-9 which depend therefrom, are both not anticipated and non-obvious over the art of record. Accordingly, Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

BELL, BOYD & LLOYD LLC

BY _____

B. Joe Kim
Reg. No. 41,895
P.O. Box 1135
Chicago, Illinois 60690-1135
Phone: (312) 807-4292

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specificati n:

The paragraph beginning on page 5, line 10 has been amended as follows:

Figure 3 shows the basic circuit diagram of an XPM compensation arrangement. A wavelength-division multiplex signal WMS is transmitted via a transmission fiber 1 and amplified by a fiber amplifier 6. The input of the fiber amplifier is preceded by an XPM compensation device 5, 3,4, 2. This contains a phase modulator 2 which is supplied with the wavelength-division multiple signal WMS. The phase modulator is here followed by a measurement transducer or coupler 5 which branches off an optical measurement signal OMS corresponding to the wavelength-division multiplex signal whereas the main component of the energy is supplied to the input of the fiber amplifier 6. The optical measurement signal OMS is initially converted, in an opto-electrical transducer, into an electrical measurement signal EMS which can also be used for control purposes for the amplifier, and is then amplified in an electrical amplifier 4. The control signal SMS generated in this manner controls the phase modulator 2 in such a manner that the cross phase modulation generated in the fiber amplifier 6 is at least almost (pre-) compensated for.